

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2005/000571

International filing date (day/month/year)
16.02.2005

Priority date (day/month/year)
16.02.2004

International Patent Classification (IPC) or both national classification and IPC
H03F1/32, H05K7/20

Applicant
E2V TECHNOLOGIES (UK) LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2005/000571

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2005/000571

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-26
	No: Claims	
Inventive step (IS)	Yes: Claims	2,5-18,26
	No: Claims	1,3,4,19-25
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V.

1 Reference is made to the following documents:

D1 : US 5 894 407 A (AAKALU ET AL) 13 April 1999 (1999-04-13)

D2 : US 4 525 769 A (LEHMANN ET AL) 25 June 1985 (1985-06-25)

2 The present application does not meet the requirements of Article 33 (3) PCT, since there is a lack of inventive step in its claims with regard to Rules 61.1-64.3 PCT as it will be explained hereinafter.

3 With respect to claim 1, attention is directed to D1 which represents the most relevant state of the art and which discloses (see figures 1-10; column 2, line 43 - column 5, line 4) an electrical apparatus (10) having a cooling system, the apparatus (10) comprising a first cover (12) defining an enclosure for housing part of the electrical apparatus to be cooled; a second cover (50) substantially enclosing the first cover to define a surrounding space therebetween, the surrounding space having an inlet (67) and an outlet (66); and second circulation means (72) for causing a cooling fluid to circulate around the surrounding space between the first and second cover (see column 4, line 55 - column 5, line 4 and figure 10); heat transfer means (38) between the enclosure (12) and the surrounding space, such that heat is transferred from the enclosure to the cooling fluid in the surrounding space and out of the outlet (see column 3, lines 6-25 and figure 9); and a base plate (54) on which the first cover is mounted, the base plate (54) having one or more apertures communicating with the surrounding space; and wherein the second circulation means are arranged outside of the surrounding space, such that there is a flow of cooling fluid adjacent the enclosure, through the one or more apertures and through the surrounding space (see column 4, line 55 - column 5, line 4 and figure 10).

The subject-matter of independent claim 1 differs from the disclosure of D1 in that a first circulation means is provided for causing air to circulate in the enclosure;

- The objective problem to be solved may therefore be regarded as to improve the cooling efficiency within the enclosure.
- To solve this problem, the skilled man would consider document D2, which discloses an

electrical apparatus comprising a first cover defining an enclosure for housing part of the electrical apparatus to be cooled; a second cover substantially enclosing the first cover to define a surrounding space therebetween, a circulation means for causing a cooling fluid to circulate around the surrounding space between the first and second cover; and heat transfer means between the enclosure and the surrounding space, such that heat is transferred from the enclosure to the cooling fluid in the surrounding space. The document teaches in particular the use of a fan (56) for causing air to circulate within the enclosure to improve the cooling efficiency (see figure 1, column 4, lines 59-66). It would therefore be obvious to the person skilled in the art, to apply the teachings of D2 to an electrical apparatus according to D1, thereby arriving at the subject-matter of claim 1. Thus, the subject-matter of claim 1 lacks inventive step (Art. 33(3) PCT).

- 4 Dependent claims 3,4,19-25 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33 (3) PCT), insofar as the subject-matter of said claims is already disclosed in D1 (see figures 1-10; column 2, line 43 - column 5, line 4).
- 5 The application does not meet the requirements of Article 6 PCT, because claim 1 is not clear, the reasons therefor being as follows:
 - 5.1 The expression "wherein the second circulation means are arranged outside of the surrounding space, such that there is a flow of cooling fluid adjacent the enclosure, through the one or more apertures and through the surrounding space" used in lines 22-26 of claim 1 attempts to define the subject-matter in terms of the result to be achieved, without providing the technical features necessary for achieving this result. Thus, claim 1 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined.
 - 5.2 It is clear from the description on page 16, lines 18-26, that the present application aims at providing a high power amplifier with an improved air cooling system so that the dimensions of the device can be kept as small as possible. And this result is achieved by limiting the number of fans and using the cooling air efficiently, that is, by using the fans (50,52), provided in the RF enclosure (30) for removing heat from the components enclosed in said RF enclosure, in order to create a cooling airflow in the surrounding

space between the first and the second covers.

Therefore, the following features are regarded as essential to the definition of the invention:

a) the RF enclosure (30) defined between the base plate (40) and the base housing (6) (see description page 6, lines 5-6) and comprising:

i) heat-generating components,

ii) an air inlet and an air exhaust

iii) and fans (50,52) for removing heat from said components (see page 6, lines 16-24 and page 7, lines 19-24) and creating a cooling airflow through the one or more apertures of the base plate in the surrounding space.

Since independent claim 1 does not contain these features, it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

- 6 The features of dependent claims 2,5-18,26 is neither known from, nor rendered obvious by, the available prior art.

However, a new independent claim that would overcome the objection raised in the above-mentioned paragraph 5.2 would also be regarded as new and inventive.